



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/630,111

07/30/2003

Otis G. Peterson

S-100,643

8327

35068

7590

07/27/2004

UNIVERSITY OF CALIFORNIA
LOS ALAMOS NATIONAL LABORATORY
P.O. BOX 1663, MS A187
LOS ALAMOS, NM 87545

EXAMINER

BEHREND, HARVEY E

ART UNIT

PAPER NUMBER

3641

DATE MAILED: 07/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/630,111

Applicant(s)

PETERSON, OTIS G.

Examiner

Harvey E. Behrend

Art Unit

3641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/3/04
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 6, 7, 11, 29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) 1-5 is/are objected to. 8-10, 12-28
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/2/03
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

1. Applicants election without traverse in the 5/3/04 response of Group I, species A (hydrogen only), potassium as the specie of coolant in the heat pipe, U-235 as the fissile isotope and, U-238 as the fertile isotope, is acknowledged.

Applicant lists claims 1-5, 8-10, 12-28 as readable on each of the elected species.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-5, 8-10, 12-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are vague, indefinite and incomplete, particularly in failing to adequately structurally recite all of the requisite components and their interrelationships, necessary and critical to the successful operation of applicants invention. See MPEP 2172.01.

As examples thereof, claim 1 does not recite that the fissile metal hydride is itself, in direct contact with the hydrogen atmosphere (merely stating that the "core" is so exposed, is not the same, as the "core" could be composed of cladded elements); that the "non-fissile material" is itself, in direct contact with the hydrogen atmosphere; etc.

The claims do not provide proper antecedent basis for all terms present. As an example thereof, note the term "a containment vessel" in claims 14 and 16.

Note that it is not possible for a "port" by itself to extract gas (be a "gas extraction apparatus") or, to be a "hydrogen isotope pressurization apparatus".

Claims such as claim 12 are vague, indefinite and incomplete as to what all is meant by and is encompassed by the term "non-essential" gases. The specification refers to these gases as fission product gases (which will always be produced) some of which are highly neutron absorbent. Since these fission product gases, etc., can comprise a significant proportion of the atmosphere, it is improper for these claims (e.g. claims 12-14) to be dependent on claim 10 which recites the atmosphere as being essentially hydrogen. Consequently, claim 10 is vague, indefinite and incomplete as to what all is meant by and is encompassed by the term "essentially".

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the features of a "means for controlling said non-fissile material temperature", a "gas extraction apparatus", a "hydrogen isotope extraction apparatus", a "hydrogen isotope pressurization apparatus", the neutron reflector (the specification on page 9 states the neutron reflector and the temperature controllers, are not shown) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and

appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-5, 8-10, 12, 15-28 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Magladry (I) (US 3793144).

Note the drawings (particularly Fig. 1B), cols. 1, 6, 7, 8, 9, 10. Note thermal insulation 128 in Fig. 1B. The claimed "trays" read on elements 124 in

Art Unit: 3641

Fig. 1B. Note that the reference shows what would be considered in the art as heat pipes. Col. 5 lines 40-45 states the coolant can be potassium.

6. Claims 1, 8, 9, 12, 18-21, 25-28 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Haake et al.

The reference shows the actual claimed structure. Note that while the fissile hydride of the fuel elements comprising the core, may be placed within cladding tubes, this core (since it is in a BWR) is exposed to steam (which includes hydrogen as part of the water (steam)).

The "non-fissile material" reads on the Zr in the fuel rods (claim 1 does not require the fissile hydride and the "non-fissile material" to positioned any distance apart).

The "means for controlling ..." and the "means for extracting ..." read on the coolant.

As to claim 19, since no reactor utilizes 100% enriched uranium, there will inherently be some U-238 along with the U-235 and, the claimed "non-fissile uranium hydride" reads on such.

The claimed "trays" of claim 21 do not connote any structure to define over the fuel elements of the reference.

7. Claims 1, 8-10, 12, 15-20, 22-28 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Magladry (V) (US 3627633).

Note the drawing and cols. 1-5.

The non-fissile material reads on the zirconium hydride in element or reservoir 28.

Note that the metal hydride in reservoir 28 (e.g. element 102' in Fig. 3) can be uranium (col. 3 lines 11-25).

The claimed reflector reads for example, on Be shell 34, copper block 114 (col. 4 lines 13-20), element 401 (col. 5 lines 24+).

While the reference refers to the use of heat pipes 101 (col. 2), it also indicates that helium can be used as a coolant (col. 5 lines 31+).

8. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Magladry (V) in view of any of Magladry (I), Casey or McGuire.

The primary reference discloses the use of a heat pipe. While the primary reference may not clearly recite the working fluid in the heat pipe, it is conventional in the art to utilize a liquid metal such as potassium as evidenced by any of Magladry (I) (note col. 5 lines 40-45), Casey (note col. 2 lines 53-65), or McGuire (note col. 4 lines 28+) and to have accordingly utilized potassium as the working fluid in the heat pipes of the primary reference would have been prima facie obvious.

9. Claims 1, 8-10, 12-20, 22, 25-28 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Marwick (II) (US 4344913).

Note the drawings. The claimed fissile metal hydride reads on the plutonium hydride core and/or the surrounding uranium hydride layers (e.g. shell 81), the non-fissile material reads on the thorium in hydride shell 82 as well as on the magnesium and thorium in hydride shell 83 (e.g. see col. 3 lines 58, col. 6 lines 11+, col. 8 lines 6+).

The atmosphere is of hydrogen and fission product gases (e.g. see col. 7 lines 55+, col. 9 line 56).

The claimed gas ports (through which hydrogen can be injected) read on the spray nozzles (col. 2 lines 56-65, col. 5 lines 6-35, col. 9 lines 38-41 and 53-57).

The claimed extraction ports read on the plurality of openings 76 (col. 9 lines 42+).

The claimed reflector of claim 22 reads on intermediate shell 82.

10. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Magladry (I) as applied to claims 1-5, 8-10, 12, 15-19, 21-28 above, and further in view of any of Culver, Breze or Kolflat.

Culver shows it is old and advantageous to form a metal hydride shield material of a plurality of stacked plates or platelets (e.g. see col. 8 lines 50-67 and col. 6 lines 32+).

Breze shows it is old and advantageous to form a shield or blanket component of a plurality of trays (e.g. see Fig. 4 and col. 3 lines 34+).

Kolflat shows it is old and advantageous to provide a shield means in the form of a plurality of trays (e.g. see Figs. 1, 4).

Accordingly, it would have been prima facie obvious to have modified the reservoir 112 of hydride pellets in the primary reference by placing the hydride pellets in a plurality of trays so as to thus obtain the advantages of the use of trays as shown by any of the secondary references. Note also that the illustrated openings or passages between the trays in any of the secondary references, would provide for more effective movement of hydrogen between and among the hydrided portions of reservoir 112 of the primary reference.

11. The following is a quotation of the first paragraph of 35 U.S.C. 112:

Art Unit: 3641

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 10-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

There is no adequate description nor enabling disclosure of what all is meant by and is encompassed by the term "non-essential" gases (note the discussion of this issue in section 2 above). The specification indicates these "non-essential" gases can be fission product gases.

Since these fission product gases will always be produced, can be highly neutron absorbent, can comprise a significant proportion of the atmosphere, and, applicant specifically provides equipment to remove some of these fission product gases from the atmosphere, these fission product gases are clearly considered (even by applicant) as significant.

The disclosure is insufficient as to how and in what manner, these (apparently significant) fission product gases can be considered "non-essential".

The term "non-essential" is recited in claim 12 which depends from claim 10.

Claim 10 recites the atmosphere as consisting essentially of hydrogen.

In view of the above discussion concerning the presence of fission product gases in the atmosphere, there is no adequate description nor enabling

Art Unit: 3641

disclosure of what all is meant by and is encompassed by the reference in claim 10 to the atmosphere consisting essentially of hydrogen.

While an applicant can be his or her own lexicographer, no term may be given a meaning repugnant to the usual meaning of the term. See MPEP 2173.05(a).

12. The other references cited further illustrate pertinent art.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harvey Behrend whose telephone number is (703) 305-1831. The examiner can normally be reached on Tuesday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone, can be reached on (703) 306-4198. The fax phone number for the organization where this application or proceeding is assigned is (703) 306-4195.

Any inquiry of a general nature or releasing to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-1113.



Behrend/vs
July 7, 2004

HARVEY E. BEHREND
PRIMARY EXAMINER